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*This volume includes also other lectures delivered in Copenhagen in 1985 at a NORDITA Lecture Course entitled 'Quantum fields and laser spectroscopy'.

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After this article had been submitted an important paper modifying the cosmological content of the Absorber Theory of Radiation was published by Hoyle, F. and Narlikar, J. V. in *Proc. Roy. Soc. London*, 1993, A442, 469-484. The authors now take account of an event horizon in the universe. The result is that the divergent integrals encountered in conventional QED, as in Hoyle and Narlikar's previous work¹⁰, are replaced by finite quantities whose value depends on the Hubble constant. The procedures for renormalization of mass and charge become mathematically acceptable instead of specious. A cloak of respectability then, awaits a theory of radiation prepared to base itself upon a realistic cosmology.

The unscientific side of the ecological movement

P. R. Masani

The ecological movement has fallen short in ignoring the earth's noospheric layer (§ 2) and the fact that the life-destroying interactions stemming from this layer are abnormal (§ 3), and that man is a fallen mammal, Homo peccator (§ 4). The symbiosis of Homo sapiens, faber, peccator (§ 5) and the persistent misappropriation of economic surplus value (§ 6) creates dilemmas for the ecologist (§ 7).

The major noospheric pollutants are the marketing sector of capitalism (§ 8), miseducation (§ 9) and the promotion of idolatry by the judicial system (§ 10). Ecological action, not evasion, on the economic, educational, communications, aesthetic and political fronts is necessary (§ 11 and Postscripts).

Part I. Earth and man

1. Introduction

To run the ecological enterprise successfully, it is necessary to understand what the earth is, and since the enterprise is concerned primarily with damage emanating from human folly, and with the remedial engineering that human ingenuity can provide, it is also necessary to understand the nature of man. Thirdly, it is necessary to understand from where the resources required for the enterprise are to come. On all three counts, the ecological movement falls short.

2. The earth and its layers. The noosphere.

The biosphere, which 600 million years ago comprised protoplasmic scum on the primordial sea, has by slow orthogenesis produced a layer of plantalia over land and sea, that in turn has sustained an evolution of plant-eating animals, and then carnivores by increasing symbiotic association of independent species. This in turn has supported an evolution of higher mammals, the primates, anthropoids and eventually man, by a process of increasing cerebration and manual dexterity.

Hominization differs, however, from all earlier biological radiations. It has, as it were, superimposed a new layer over the biosphere, by virtue of endowing man with high intelligence, self-consciousness, linguistic prowess and inventiveness. This layer was called the *noosphere* by Father Pierre Teilhard de Chardin (1881-1955) after the Greek word *nous* for mind. He regarded it as a cerebral 'halo' covering the globe. We may think of it as comprising all messages, whether in the mobile

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form of electromagnetic signals propagating through space, or electrochemical impulses in the nervous system, or as more permanent recordings in print or other devices, or in the memory, individual and racial.

Just as the advent of life marked the end of the Azoic era and the commencement of the Paleozoic, Mesozoic and Cenozoic eras, Teilhard de Chardin saw the advent of cerebration as the start of a new era, which he called the *Psychozoic* era. He gave good reasons for keeping the human species within the class of mammalia¹.

To see how the idea of the noosphere fits into cybernetics, recall that the 'patron saint' of cybernetics, as Norbert Wiener called him, is Gottfried Wilhelm Leibniz (1646-1716). His monadic doctrine, devoid of the mind-matter cleavage that afflicted the philosophy of Rene Descartes, endowed each monad with the power of perception, albeit often a blurred one. Another great thinker in this tradition, which denies the sharp separation of mind and body, is the American philosopher Charles Sanders Peirce (1839-1914). 'Matter', said Peirce, 'is just mind hidebound in habit'². A. N. Whitehead, for whom the central concept was not substance but *prehension*, is also close to this tradition.

In 1932, Wiener remarked on the proximity of Leibnizian monadology to the de Broglie-Schrodinger wave mechanics:

Thus, each electron possesses its own world of dimensions, which mirrors the many-dimensional universe of perfect cause and effect in an imperfect, four-dimensional, non-causal image. It is surely not fanciful to see in this a parallel to the Leibnizian monads, which live out their existences in a self-contained existence in pre-established harmony with the other monads, yet mirror the entire universe³.

In 1934, in a remarkable speculative paper entitled *Quantum Mechanics as the Basis for Philosophy*⁴, the British geneticist J. B. S. Haldane (1892-1964) suggested a way to explicate scientifically the proximity of mind and matter by means of this very mechanics. He proposed that the de Broglie wave system associated with a material system be looked upon as the *nascent mind* of the system. In the same year, 1934, Wiener elated by this paper, pointed out the affinities between Haldane's position and that of Leibniz⁵. It would be out of place here to dwell further on this interesting subject, except to say that the idea of the earth possessing a noosphere is thoroughly consonant with cybernetical thought.

In conclusion, it is unscientific to accept the concept of a biosphere and to reject the concept of a noosphere. For the ecologist the noosphere should be as much a part of the earth as any other sphere, such as the hydrosphere. Indeed, by virtue of its being the cause of most ecological woes and the seat of all ecological action, the noosphere should, from the ecologist's

standpoint, be the most crucial layer. Its health and its protection from man's own perversity should be one of his major concerns, for obviously *noospheric pollution is the source of all pollutions*.

3. Life destroying interactions of the spheres and human nature

Ecologists, of course, have to understand the fundamental long-lasting terrestrial interactions that have made the earth what it is. What concerns us here, however, are the interactions brought on by the larger animals and by some of the physical forces of nature, for it is these that provide an understanding of man. All but a few of these interactions (such as soil fertilization by animal manure) involve the *maiming and killing of life*. They are shown in the accompanying chart (Figure 1), which calls for some explanation.

The interactions necessitated by the laws of thermodynamics (upper arm in Figure 1) fall into two classes. First are earthquakes, floods and the like, which are non-teleological in the cybernetic, i.e. servomechanical, sense of the word *teleology*, (note 1, see also ref. 6). Second are the purposeful encounters, undertaken by animals that result in violence. All of these again stem from the operation of the Second Law of Thermodynamics. The sustenance of life requires a steady intake of negative-entropy from the surroundings, with incumbent enhancement of the degradation of (i.e. rise of entropy in) the surroundings, cf. Schrodinger⁷. In the animal world such survival-necessitated intake of negentropy results in the herbivores devouring plant life and the carnivores devouring animal life. Such inter-

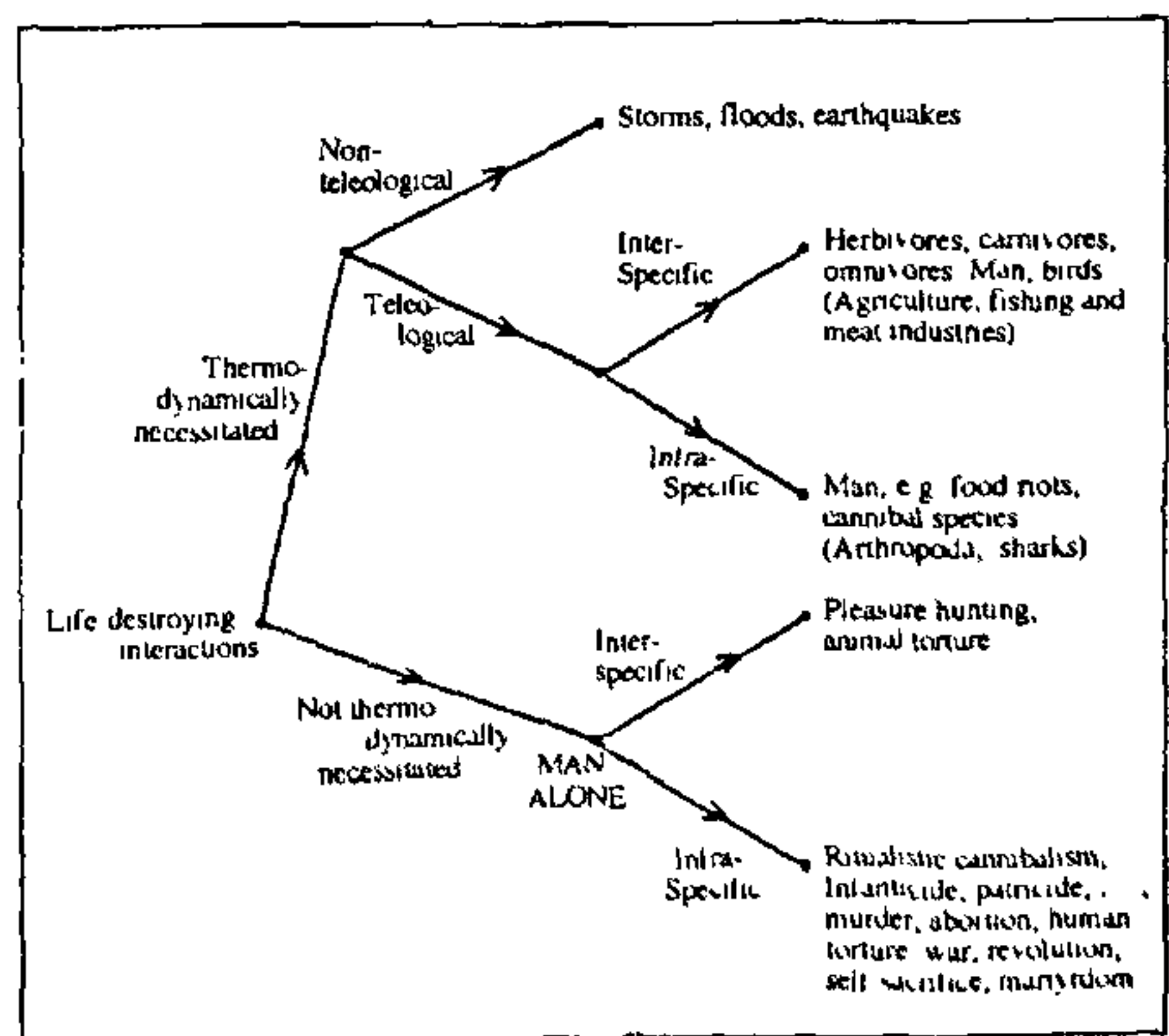


Figure 1. Life-destroying interactions between the layers of the earth.

specific encroachment by all species, the infra-specific encroachment by some (e.g. spiders and sharks), and the control of their sizes by ecological feedback, involve strife, cruelty and death. Such violence stems solely from the operation of natural law.

With the advent of man, however, comes a very conspicuous departure from the above pattern (lower arm in Figure 1 marked 'Man Alone'). *Almost none of man's infra-specific killing is demanded by natural law.* This applies even to some of his inter-specific killing. The first is exemplified by the barroom brawl that ends in murder, the second by the sport of fox hunting. According to cybernetics, the cosmos is stochastic in its organization. Its incomplete orderliness permits phenomena such as *growth, purpose, learning, communication, consciousness, free decision making, etc.*, that would be impossible in a strictly deterministic cosmos. A barroom brawl or a fox hunt is not brought on by the Laws of Nature, but by human decision. The same applies to infanticide, etc. This new violence is original with man and endemic to human nature.

4. The fall of man

Thermodynamically lawful infra-specific killing is appropriate to the *submammalian species* of Arthropoda and fish. The (unlawful) acquirement of this propensity by man, a mammal, thus marked a retrogression or 'fall'. This homicidal propensity in man reflects certain unique traits in his makeup, to wit, *arrogance, avarice, and jealousy* (leading to infanticide, patricide, etc.), that are missing in the other mammals. Under the aegis of man's high intelligence, these traits take on less violent forms. Language provides a vehicle to continue exploitation without going through the agony of actual homicide. Insulting, lying, bluffing, evasion, circumlocution and bureaucratic fine-printing provide the means for non-violent exploitation, generating thereby the *semiotic vices*, dishonesty, hypocrisy, deceitfulness and treachery. As a result of arrogance and avarice on the one hand, and gullibility, cowardice and acquiescence on the other, the human species has clearly distinguishable 'haves' and 'have nots', which no other mammalian species has.

This oddity of man was perceived by its observant and sensitive members – the great poets and sages – very early in human history. Not surprisingly, man's mythology is replete with tales of injustice, treachery and murder by gods and men. They are there in all the epics as well as in early Scriptures, and all great world religions have some doctrine of the Fall of Man. From the earliest times, however, man has attempted to free himself from this oddity. The world religions have all condemned man's unmammalian conduct, and all have promulgated prosthetic *moral codes* designed to restore

human behaviour to mammalian standards.

From the standpoint of evolutionary anthropogenesis, man's fall is explainable as follows. Climatic changes during the Pliocene (over 5 million years ago) forced the primates out of their arboreal habitat. In order to survive, the land-based australopithecines, with digestive systems dependent on high arboreal protein, had to resort to cooperative hunting using stone weapons. Such hunting improved with the advent of *Homo habilis*. At some point, these weapons designed to hunt animals, were used to hunt conspecifics. Thus the 'Fall' has to be regarded as the transition from animal-hunt to man-hunt in the history of the hominids. It probably began about two million years ago and lasted about a million years (note 2). The subsequent prosthetic efforts of man can be explained in terms of the challenge-and-response principle that Arnold Toynbee has advanced for the explanation of much of human history⁹.

From this account it is clear that *Homo sapiens* and *Homo faber* are inadequate characterizations of the human species. It should rather be *Homo sapiens, faber, peccator*.

The foregoing considerations are summed up in the table in Figure 2.

5. The symbiosis of *Homo sapiens, faber* and *Homo peccator*

It would be erroneous to consider the three characteristics of man independently, for the nexus between man's sinfulness and his mental and manual dexterity is ingrained.

Figure 3 illustrates this symbiosis. A prime mover in the development of language was the use of vocatives in social hunting, first of animals, then of men. From the Stone Age on, the demands of warfare have greatly spurred the growth of knowledge and science, applied and even pure, and a prime beneficiary of such advance-

<u>Primary vices</u>	Arrogance, avarice, jealousy .
<u>The transition</u>	Animal hunt → Animal and Man-hunt (Its duration = 1 million years?)
<u>Ramifications of the Fall</u>	
(a)	<u>Abuse of communication</u> Insulting, lying, bluffing, evasion, circumlocution, bureaucratic fine-printing
(b)	<u>Semiotic vices</u> Dishonesty, hypocrisy, deceitfulness, treachery
(c)	<u>Human exploitation</u> Arrogance and avarice → gullibility, cowardice and acquiescence → haves and have-nots
<u>Characterization of Man</u>	<i>Homo sapiens, faber, peccator</i>
<u>Challenge</u>	Human wickedness
<u>Response</u>	The moral code
<u>Prosthesis</u>	Religion, Science, Art

Figure 2. The fall of man (Acquirement of the homicidal propensity⁹).

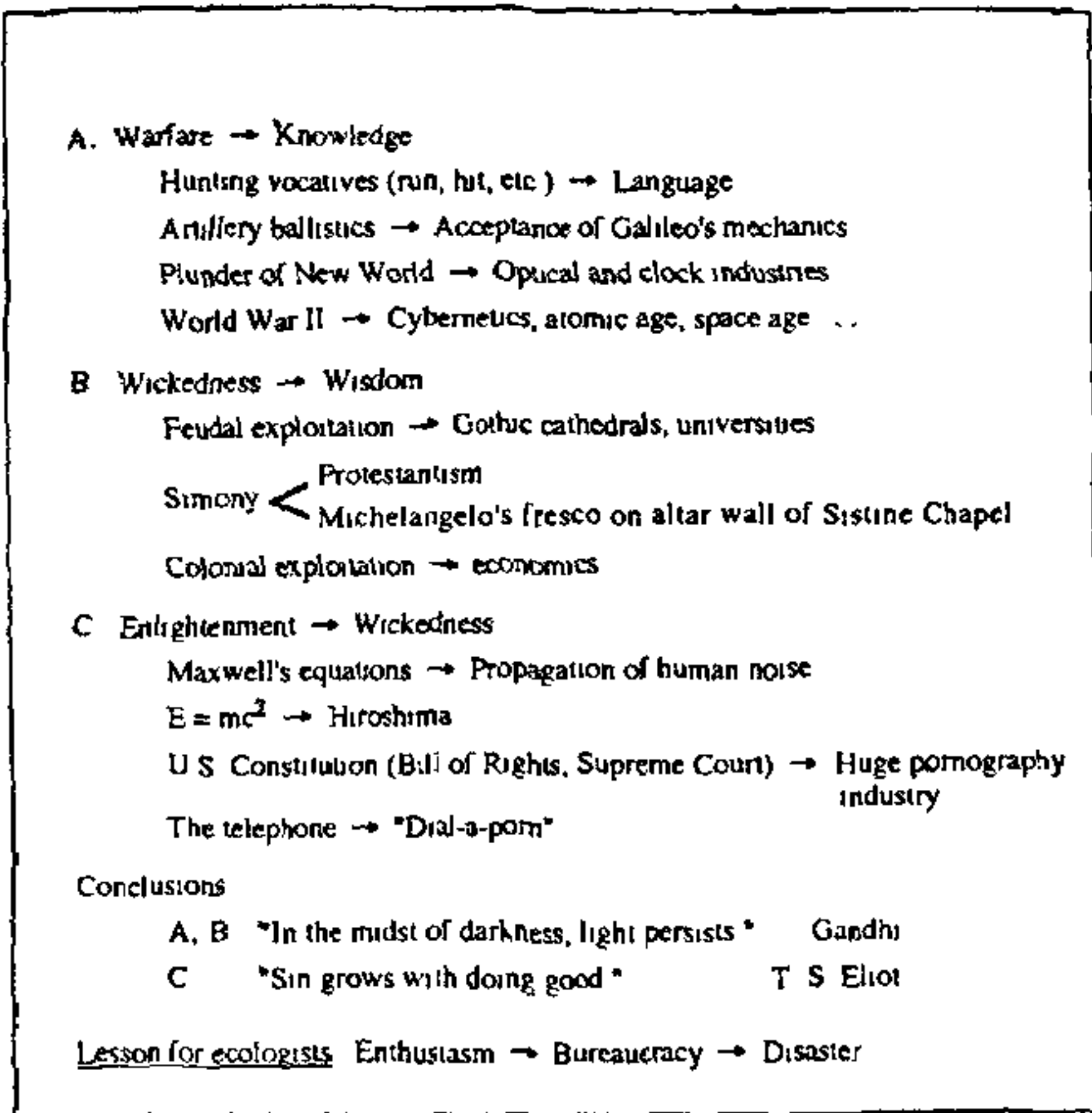


Figure 3. The symbiosis of *Homo sapiens, faber* and *Homo peccator*.

ment has again been the war-machine. As early as the 4th century B. C., Plato wrote in the *Republic*:

... in any military maneuver whether in actual battle or on the march, it will make all the difference whether a general is or is not a geometrician¹⁰.

War being a structured activity, what Plato said of geometry holds for practically every branch of pure mathematics. This symbiosis infests all phases of human life. Just as the discovery $E = mc^2$ gave us Hiroshima, so the Bill of Rights, as interpreted by the Supreme Court of the United States, has handed us a multibillion-dollar pornography industry. On the other hand, the evil practice of selling indulgences by the Church led to Martin Luther's great protest, and allowed Michelangelo to finish some of the greatest art in the world.

The items in the table marked: Colonial exploitation → Economics refers to the fact that David Ricardo, Thomas Malthus, James Mill and John Stuart Mill were all associated with the East India College in Hertfordshire in one capacity or another. Their activity was thus sustained by the surplus value expropriated from Indian peasants. We might also bring Adam Smith into this category, for there is evidence that he wrote his *The Wealth of Nations* only after some urging by Lord Shelbourne, the political bigwig of the East India Company and its college. The items marked C are explained in Sections 8-11 below.

6. The nature of human exploitation

To see how the Fall of Man bears on noospheric pollution, it is essential to analyse further the nature of human exploitation. Such exploitation stems, as we saw (§4), from the confluence of the human vices of arrogance and avarice on the one hand, and gullibility, cowardice and acquiescence on the other. A quantitative measure for the degree of exploitation in economic transactions, of much importance, has emerged from the normative economic debates of the Descartists (note 3) of the 12th century as to what is a 'fair exchange'.

Guided by the Bible and the teachings of the Church Fathers, the Descartists rejected the Roman conception according to which an exchange is fair if it is freely made. An exchange between a well-off food merchant and a starving person need not be fair just because it is freely made. From this starting point, the Descartists were led to the notion of a 'just price' (*iusto pretio*), devoid of 'sinful gain' (*turpe lucrum*). In the 13th century Albertus Magnus and St. Thomas Aquinas, inspired by these ideas on fair exchange and by the newly discovered *Nichomachean Ethics of Aristotle*, advanced an essentially labour theory of economic value in their commentaries on Aristotle's book¹¹⁻¹³. In the 19th century, Karl Marx made a crucial contribution to the theory by defining the concept of *surplus value* (note 4). This concept applies in fact to labor among all mammals and birds.

The nocturnal owl, for instance, normally sleeps by day and hunts its food at night. But it works extra hours to build a nest for its young, and when the eggs are laid it hunts at night, but during the day the parent owls watch over the nest and ward off predators. The nest-building effort and the surplus labor in daylight vigil contributes to the survival not of the parent owls but of the offspring. Its value is not ontogenetic but phylogenetic. It is therefore appropriate to speak of this surplus labor as being *phylogenetic labor* or *species labor*.

In human society the species labor consists in the extra work that people do beyond what is needed for their individual survival. It is responsible for the growth of the human population and for all human culture. Unlike the owl, however, *Homo peccator* siphons off some of the surplus value into non-constructive, egoistic channels. This is exploitation in the economic field. Briefly, *exploitation* is the abortion of and/or misuse of surplus labor. We call a political economy *exploitative*, if it curbs the growth of species labor and/or diverts the surplus value created, away from the species welfare by misappropriation.

The first type of exploitation, to wit, the abortion of surplus value, occurs under tyrannically-run or highly bureaucratized regimes. (Without work, a person

obviously cannot produce value, surplus or non-surplus.) The second type of exploitation, viz. the creation of surplus value and its subsequent misuse, occurs in more viable economies. However, not all the misused surplus goes into the pockets of the wealthy. A handsome portion gets into the hands of a semi-institutionalized class of delinquents that these exploitative economies nurture, and into the hands of bureaucracies kept to manage delinquency.

The balance of ontogenetic and phylogenetic interests – the production of surplus value in the right amount at the right time, and its full conversion into species value – that the owl accomplishes instinctively, becomes for man a difficult and long undertaking that calls for deliberate effort, and has no clear end in sight. This aspect of the Fall of Man is referred to as *self-alienation*.

7. *The dilemmas of ecology*

Human exploitation and self-alienation pose some serious dilemmas for the ecologist. Where is the surplus value required to protect and clean up the natural environment to come from? The total amount of such value at a given moment, generated by surplus labor, is finite. Either the ecologist will have to increase this total, or he will have to draw the required value away from some other human undertaking.

To significantly increase the production of surplus value, the ecologist will have to focus on regions of the globe where it is continually being aborted, such as Haiti. It is unlikely, however, that such abortion can be stopped without forcing out the tyrannical or bureaucratized regimes in control. But if the requisite political operation to accomplish this deteriorates into a protracted and violent struggle, the environmental damage can be substantial, as the example of Africa shows. This confronts us with the following dilemma:

Dilemma 1. How must the ecologist dethrone the tyrannical or bureaucratized regimes that abort the creation of surplus value by their people without damaging the environment?

Granting that the displacement of the offensive regime has been accomplished peacefully, the problem is far from over. First, what is to replace the displaced regime? The simple answer 'A democratic government based on adult franchise' will not do, for as Mao Tse-Tung wisely warned, power comes from the barrel of a gun. The ecological side will have powerful foes, and unless it can earn the support of the armed forces, it will not carry power for long. Furthermore, the efficiency of the democratic process rests on an electorate sharing common attitudes on fundamental moral issues. This is most often not the case. Second, the

activation of the work force, long held idle, will require large investments of capital that will drain surplus value away from other sectors. This brings us to another interesting question:

Question. From what undertakings must the ecologist wrest away the surplus value required for ecological purposes?

The answer is easy to state though not to carry out: *wrest it from undertakings that pollute the noosphere.* We thereby kill two birds with one stone: disarm the polluters of the noosphere and also procure the necessary resources. The ecologist has to first find out, of course, who the polluters of the noosphere are.

Another dilemma emerges when we realize that the noosphere, which is the fountain of ecological action, is itself polluted:

Dilemma 2. Is it possible for a polluted layer A of the biosphere to initiate an interaction that can depollute another layer B?

In the realm of pure inquiry it is possible for the sapiens part of the ecologist to operate in isolation and come up with correct solutions. But beyond inquiry the ecological enterprise becomes political, and in realms where a contest between adversaries is involved, *Homo peccator* is rampant. There is every danger that like other political movements, it will get bureaucratized and collapse (note 5). In this situation the ecologist, like the rest of us, is rather like a wounded surgeon who wishes to do surgery on a wounded patient.

To what extent must the surgeon heal himself before he can operate? Or to drop the metaphor, how serious is the disease of the noosphere and to what extent must it be cured before a venture outside becomes feasible? The diagnosis, prognosis and therapeutics of the diseases of the noosphere have to come high on the ecological agenda. Two questions have to be addressed:

1. Which undertakings pollute the noosphere?
2. How serious is this pollution?

These considerations on the nature of noospheric pollution, and the problems they create for the ecologist, are summed up in the next table (Figure 4).

Part II. *The pollutants of the noosphere*

8. *Noospheric pollution created by the marketing sector of capitalism*

There is in vogue, especially in the United States, an uncritical opinion that equates two different ideas: (i) free enterprise, (ii) capitalism. The error involved should be obvious. For an enterprise to be free, it must abide by the understanding of freedom that has evolved from the

Political objectives

1. Dethronement, without ecological damage, of regimes that abort the creation of surplus value
2. Wrestling surplus value away from enterprises that pollute the noosphere

Preliminary inquiries

1. Which undertakings pollute the noosphere?
2. How much noospheric damage do they cause?

N.B. The ecologist is like a wounded surgeon, who wishes to do surgery on a wounded patient

Figure 4. Noospheric pollution is the source of all pollutions.

Scriptures and the minds of scholastic and other thinkers who have dwelt on the nature of human exploitation. An enterprise is *free* if it respects earth and man, i.e. does not involve exploitation or 'sinful gain'. The Amish people, who live in Pennsylvania and Ohio, provide an example (note 6). They are hard working, own property, compete with one another, trade on the market, are relatively prosperous and non-egalitarian, but they protect the country side (note 7) and if one of them is in trouble the resources of his neighbours are placed at his disposal. Thus, to speak fundamentally, their competition notwithstanding, the Amish abide by Pastor Bonhoeffer's definition of freedom:

In truth freedom is a relationship between two persons. 'Being free' means 'being free for the other', because the other had bound me to him. Only in relationship with the other am I free¹⁴

And although the Amish own property, fundamentally they agree with St. Ambrose (340-407) that 'Property hath no rights. The earth is the Lord's and we are his offspring' (note 8).

In capitalism, this principle of good stewardship of the earth is abandoned and the taboo against 'sinful gain' is lifted. Accordingly, the true relationship between capitalism and free enterprise is the following:

Capitalism = a perversion of free enterprise caused by cupidity (note 9).

Lord Keynes made much the same evaluation when he wrote:

Modern capitalism is absolutely irreligious, without internal union, without much public spirit, often though not always, a mere congeries of possessors and pursuers¹⁵.

It is easy to give examples of the perversity of capitalism. The advertisement in Figure 5 is just one of dozens that could be cited. In this, the great invention

The Capitalist Perversion of Free Enterprise

An Insult to Alexander Graham Bell
Friend of the Deaf

truly
sex-sational!

hear real
pittsburghers
and their
dirty little secrets

TRUE

CONFESIONS

976-2000

hear at least eight confessions
on every call

record your own for others to hear
messages change every day

99¢ per sinful minute

The Pittsburgh Beat, Issue 139,
Dec/Jan 1992-1993

Figure 5.

of the telephone that Alexander Graham Bell made in the course of his noble efforts towards prosthesis of the hearing faculty of the deaf, and which he designed to facilitate verbal communication, is turned for monetary reasons, into an instrument for the enhancement of pornography by capitalists, with the aid of companies carrying the name Bell — a clear act of vandalism (note 10).

In capitalism, as in other human undertakings, the role of *Homo peccator* is unevenly distributed. Least affected is the entrepreneurial side. Entrepreneurship has promoted the ethic of hard work and frugality, and has benefited and continues to benefit human life in many ways. Where its fundamental thrust is human good and trading is fair, it is free enterprise. It is the marketing sector of capitalism that is most peccator infested and ecologically dangerous. Its negative impact stems from:

(A) its inculcation of the socially irresponsible 'buy now, pay later' mentality;

(B) the pernicious measures it takes to carry out this inculcation.

As for (A), this inculcation has resulted in hedonism

that is ecologically deleterious. The augmentation of entropy that it causes has no redeeming aspect. On the contrary, it creates indebtedness and the anxiety that accompanies it. The factor (B) calls for more explanation.

To reach the public, the marketing sector employs different channels of communication. These are privately owned and operated for profit primarily from the fees paid by the marketers to air their advertisements. In so doing, the marketers and the communications networks

- (1) enhance stupidity and mindlessness by the nauseam repetition of half-truths, laced with silly gesticulations, sexual imagery, cacophony, lewd dancing and appeals to snobbery, such as the endorsement of products by film stars;
- (2) lower taste by boosting egocentrism, bad manners, uncouth language, shabby attire, lewd and violent behaviour in their shows, and where legal loopholes permit, by boosting pornography;
- (3) debase language by constant interjection of inane expressions such as 'Pepsi generation', blur clear thought by inane substitutions such as 'chemical dependency' for 'narcotic addiction' and weaken discrimination by use of generic terms such as 'sexual activity', where one of 'marital copulation', 'fornication', 'pederasty', etc., would be more accurate.

As Professor Kenneth Stunkel has written:

Respect and zest for humanistic discourse have no chance of flourishing in a society contemptuous of language¹⁶.

By extolling the wonders of chewing gum, potato wafers and soda pop, the marketing sector's message to well-fed youth is (to adapt some lines of T. S. Eliot¹⁷), 'seek distraction from distraction by distraction, and pace forever in the hell of make believe'. The mental diet fed to youth by capitalist 'entertainment', far from developing their minds and their idealism, has resulted in cacophonous addiction followed by narcotic addiction, fornication followed by abortion, and increased prostitution and criminality. In short, the spread of mental and moral decadence is a major consequence of the activity of the marketing sector of capitalism.

All this is done to boost the sale of goods, many of which are frivolous and easily dispensable, and some harmful. Such wasteful use of natural and human resources clearly reveals the bondage of the capitalist economy to greed. This bondage to greed in turn creates subsidiary aberrations. To cite just two. The capitalist publishing industry subsidizes its scholarly publication from the profits it reaps from the sale of literary frivolity and journalistic gossip. Even so, the pricing of educational and scholarly material is

exceedingly high. University libraries are unable to buy scholarly literature. The International Copyright Convention in effect prevents most of the intelligentsia from getting to the world's great books, while easing their access to the bad ones. Second, many a university in America is financially dependent on what its football team brings in. A free enterprise society would not be so morally topsy-turvy: sport would be secondary to scholarship—not the other way around.

Hitherto, the ecological criticism of capitalist industry has been leveled against specific activities, such as off-shore drilling for oil, which threaten the physical environment. Ecologists have been strangely mute on the deforestation and excess garbage brought on by the profitable publication of trivia on a large scale, and by the distribution of huge quantities of so-called 'junk mail' by the U.S. Postal Service. However, from the scientific standpoint, which has to be sufficiently long-ranged as Wiener emphasized¹⁸, and sufficiently cognizant of the noosphere, far greater ecological damage is done by capitalism's frenzied promotion of idolatry and the noospheric pollution that results from it, than from oil drilling and the like.

9. *The substitution of idolatry for religion by miseducation*

The progress of religion is defined by the renunciation of gods. The keynote of idolatry is contentment within prevalent gods.

The factor in human life provocative of a noble discontent is the gradual emergence into prominence of a *sense of criticism* founded upon *appreciation of beauty* and of *intellectual distinction*, and of *duty*.

*A. N. Whitehead*¹⁹ (emphasis added)

A 'noble discontent' against prevalent gods is the noosphere's ideal detergent. But this noble discontent is bound to be stifled by an education system that is illiterate as to the difference between 'prevalent gods' and 'God', and shields itself from the collective wisdom of mankind by modernistic bravado. Indeed, as the record shows, the system has effectively stifled the factors that promote the discontent: first, a *sense of criticism*: i.e. the ability to appreciate beauty and intellectual distinction, and second a *sense of duty*. We have instead what Professor Stunkel has called 'cognitive dissonance'. The majority of American public schools were well described by Dr John Silbur, President of Boston University, when he wrote in 1990:

What a high-school diploma tells you is that the student was institutionalized for 12 years. You would not know whether the student had been in a prison colony, a reform school or a place for mental defectives. (quoted in ref. 20).

Today the situation is worse, and the effects of miseducation are noticeable: much current art is profane, much public debate uncritical, and social irresponsibility abounds. Adolescents idolize mortal gods, the crooning tycoon or the millionaire sportsman or actor. This is outright paganism.

It so transpires that the first requirement of a good educational system is for teachers and pupils to be aware of the difference between idolatry and good religion. Obviously it is inappropriate for schools to preach a particular faith based on a particular set of dogmas. But it is imperative that the schools inform the children that all human cultures have had religions, and instruct them on the commonality of the Scriptures of the great world religions on fundamental issues such as:

The brotherhood of man under the fatherhood of God (note 11).

The stewardship obligations of man;

The imperative for mindfulness;

Concern for the destitute;

Do unto others as you would have them do unto you;

Duty and individual responsibility.

Also, the schools must acquaint the students with the importance of viewing things *sub species aeternitatis*, both inside and outside the sciences, and make them aware of the nexus between science and religion that Einstein expressed in the words 'Science without religion is lame. Religion without science is blind'.

10. *The promotion of idolatry by the judicial system*

To see the universal and all-prevailing Spirit of truth face to face one must be able to love the meanest of creation as oneself. And a man who aspires after that cannot afford to keep out of any field of life. That is why my devotion to truth has drawn me into the field of politics; and I can say without the slightest hesitation, and yet in all humility, that *those who say that religion has nothing to do with politics do not know what religion means.*

Mahatma Gandhi (emphasis added)

Although the judicial system in the United States is somewhat unique, the lesson it teaches as to the relationship between religion and politics has an international relevance and merits consideration.

Aware of the internecine religious struggles in Europe, the American people had the framers of the United States Constitution explicitly provide that

Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof.

The people, all religious, and the framers, all theists or

deists, recognized the need for religion in the life of man (note 12). The United States coinage has the imprint 'In God We Trust', and sessions of Congress and other official observances open with a prayer. The people's understanding of the relationship between religion and politics was not far off from that of Gandhi. Indeed, the religious *Weltanschauung* of American culture was instrumental in securing both the abolition of slavery under President Lincoln, and the further emancipation of the Negro population of the United States in the 1960s.

The interpretation of the Constitution was left by the framers in the hands of the judicial branch of government, headed by a Supreme Court of eight justices. Of late the Supreme Court has made some strange rulings that have all but prohibited the public schools from intelligently discussing the place of religion in the life of man. Thereby, the brethren have in effect cast doubt on the 'In God We Trust' religious élan of American culture. Furthermore, since idolatry is itself a religion, with a pantheon made up of 'prevalent gods', to use Whitehead's words (section 9), the Court's rulings have in effect given the public schools the license to teach a particular religion, to wit, idolatry, and the cult of moral-indifference that goes with it. Thereby the court has negated an important provision in the Constitution, apart from contributing to delinquency in American life. Furthermore, the Court has exceeded its authority in disallowing schools and colleges from their traditional practice of prayer recital or an address by clergy during their ceremonial exercises. For by no stretch of the imagination can such practice be construed as establishment of a religion, especially when the schools and colleges invite clergy of different faiths on different occasions.

Aware again of the persecutions that marred European history, the American people had the framers of the Constitution explicitly stipulate that:

Congress shall pass no law ... abridging the freedom of speech and of the press.

In their interpretation of this provision, the justices have exhibited a strange naiveté that has led to extensive damage of the American noosphere.

What is free speech? All communication has two components, message and noise. Successful communication hinges on the ability to distinguish the two, and to filter out the noise. The crackling or 'atmospherics' that blurs a musical broadcast over the short-wave is a typical example of natural noise. But in human communication there is a more pernicious form of 'noise'. The sender may be a confused individual and may emit a confusing message. Worse yet, the message may be sent in order to deceive rather than to inform, and may be false. What may appear as 'message' to the

receiver, may in fact be 'noise' of a malicious form. It is important to recognize that *where there is a hidden contest, uninterrupted 'free' speech can become a vehicle of exploitation, and thus be unfree in a profound sense.*

By turning for years a blind eye to the fact that claims to 'free expression' are very often a ruse for amassing money by exploiting the weak and the gullible, the Supreme Court of the United States has beclouded the issue of what really constitutes *freedom of expression*. One needs a clear mind in order to speak freely. Without a clear mind, the voice can babble but cannot speak. If the exercise of 'free' speech by Mr. A corrupts the minds of his listeners, the cause of freedom suffers. Thus, by granting Mr. A the freedom to hammer the heads of the gullible with pornographic nonsense, the Supreme Court has delimited the exercise of free speech. It has also saddled the United States economy with a multibillion-dollar pornography industry – a gross misuse of the surplus value created by the American people. One result has been the pollution of art by depravity and vulgarity.

Now, by a strange irony, the ecologist regards the judiciary as a friend. In many suits brought before it by environmentalists and conservationists, the courts have ruled in their favor. But as we just saw, the judiciary is a confused ally that itself needs therapy. The ecological movement will falter if in its effort to save the rivers of the earth, it allows the courts to permit the pollution of the rivers of the mind, especially of the young.

Part III. Ecological action

11. Ecological action to save the noosphere

A. On the *economic front* the goal should be to supplant the marketing sector of capitalism by a more sober, more ecologically-cost effective, and more automatized mode of dissemination of product information, that is consonant with free enterprise. Such supplantation will liberate an enormous amount of surplus value, from which the ecologist can draw. For the marketing sector has many layers. There are the senior executives of multimillion-dollar advertising and public relations corporations. There are the executives responsible for designing the blurbs, with the right admixture of banality, cacophony and sex, so that they have a maximum impact on sales. There are the well-known 'personalities' (actors, sportsmen, etc.) and a host of anonymous small fry who spout the wonders of the product, and participate in the cajoling. Not to be forgotten are the entertainers, who produce the 'entertainment' that lures the public to the tube. And, of course, there are the filming crews, sound technicians, custodial and secretarial staffs. The resources used up at

present by this huge entourage could be gainfully re-employed in the ecological enterprise.

B. On the *educational front*, the struggle must be to vest educational control in long-time institutions such as the churches of the great religious faiths, the academies of sciences and arts, and the universities, with the city, the business community and other interests serving as advisors and consultants. The only requirement to teach should be a Master's degree in the subject of instruction, plus a period of apprenticeship. Gandhi's educational ideas of fusing education with productive work are most relevant in today's economic climate. Wiener's advice to the American labor unions as to how the education of the work-force could be continually upgraded to keep up with the ever-growing automatization of industry, are also most relevant. They are, in a way, an adaptation of Gandhian ideas to adult education.

C. On the *communications front*, the major fight must be to

- (a) stop the leasing of channels of communication to firms operating for profit, and financed by advertising revenue, and
- (b) entrust their operations to the long-time institutions just mentioned, with the same advisory and consulting provisions.

Primary funding must come from public revenues, with advertising revenues a second. Associations of manufacturers should be urged to sponsor cultural programs, and to use the channels as vehicles for advertisement. However, the advertisements must be well timed, orderly and intelligent, and devoid of indecent millinery.

A high priority for the channels must be the dissemination of the great artistic masterpieces of all lands and ages as well as folk art. The channels should also serve as outlets for the spreading of the great religious faiths.

D. On the *aesthetic and mental hygiene fronts*, the ecologist's ultimate goal must be to secure the fusion of the categories of artisan and artist. Accordingly, he must support efforts to activate the latent spiritual yearnings of working people. More immediately, he must oppose the capitalist habit of embellishing shoddy products with fancy labels, and demand instead the enlistment of the artistic imagination at the very outset, to design useful and aesthetically appealing products.

On the ritualistic arts, music, painting, etc., the ecological policy must be to promote folk art and also the great art of the past. On the other hand, the ecologist must strive to stop the flow of mercenarily motivated art that panders to the weak side of the human ego (cacophony, pornography, etc.) by a *defacto* censorship. Here the

objective must be to ensure that the free flow of the human spirit is not damped out by peccator noise. The mental environment needs as much legal protection as the physical.

To turn to the political front, ecologists should note that whereas a democratic system of government requires for its proper functioning a well-educated public, provisions for ensuring the fulfillment of this precondition are not there in the written constitutions. In the United States, for instance, the schools have increasingly drifted away from serious education. Keen observers such as Wiener had discerned this drift as early as 1935. 'Our secondary schools', he then wrote, 'are characterized by a slipshodness and amateurishness of which we can only think with pain'²¹. But this was not a matter that could be adjudicated.

This lacuna in the U.S. Constitution stemmed from the blurred religiosity of the age in which it was written. The people and the framers were religious, but the political thinking of the age was guided by the intellectually feeble idea that religion is confined to private life, rather than by the more profound and realistic doctrines of classical antiquity, voiced by Gandhi. As a result, the Constitution is silent on the central principle of good government, to wit, the City of Man has to work in consonance with the City of God. This discovery is the work of *Homo sapiens*, and the fact that its application by *Homo sapiens-peccator* led to centuries of squabbles between emperors and popes, does not affect its integrity. The first axiom of a good constitution must be an acknowledgement of this principle. And to show seriousness of intent, the constitution must contain clause or clauses to the effect that:

No law shall be passed that infringes on the principle of human brotherhood, or permits defiance of the good stewardship obligations of man.

Such a provision is theocratic in the Wienerian sense that it subordinates the short-time interests of the political community to the long-time interests of the human race¹⁸. But what is ecology if not the protection of the long-time interests of man?

Such constitutional provisions are necessary for good government, but no aggregate of such provisions can ever ensure good government. Every government will sooner or later get polluted by its bureaucracy, and lose the Mandate of Heaven, as Mencius would say. When that happens, it becomes the people's duty to engage in what St. Augustine called *sedition iustia* or just revolution. The ecologist should have the wisdom to see the recurring necessity for such revolutions. For as St. Augustine observed, without justice, governments are little better than 'gangs of criminals on a large scale'. But revolutions confront the ecologist with the dilemma

we noted in Section 7: revolutionary fires can hurt the physical and natural environment even as they purify the mental. The only viable form of revolution is one based on non-violent warfare.

The struggle to save the earth by saving its noosphere may well call for a recurring revival of non-violent civil disobedience, with non-payment of taxes as a major plank, somewhat akin to what Mahatma Gandhi attempted in India. In any case, the everlasting struggle to save the earth and the everlasting struggle towards a moral and just society are faces of the same coin.

Postscript 1: The bureaucratic contamination of scientific research in Russia (note 13)

An example of noospheric pollution is offered by the hampering of scientific research by a bureaucracy whose origins go back at least to the Breshnev era. This bureaucracy has thrived by the device of proliferating the number of research institutes. What under a good organization would become departments (with chairmen and a small staff) within scientific research institutes are turned into full-fledged institutes.

Thus the city of Irkutsk has (or had until very recently) the following institutes of the Russian Academy of Sciences:

1. Irkutsk Computer Center
2. Institute of Geography
3. Institute of Geochemistry
4. Institute of Crust
5. Institute of Organic Chemistry
6. Siberian Institute of the Earth's Magnetism, Ionosphere, and Radio Waves
7. Siberian Institute of Physiology and Biochemistry of Plants
8. Limnological Institute
9. Baikal Ecological Museum (Institute)
10. Siberian Institute of Energy

Each institute has a Director and two or three deputy directors with secretaries, accountants, inspectors and others—a total staff of about 400 or 500. Controlling these institutes is a Presidium of bureaucrats, comprising one President or Chief, two Deputies, three to five secretaries, and Party and Trade Union Committees, both now defunct. There are on the average 35 to 40 persons in the Presidium. Each of them has a private telephone (note 14). The Presidium has a garage of about 50 buses, cars and trucks, and a total staff of a few hundred.

In this set-up, active research scientists are poorly provided for. Their salaries are about one half of what is earned by the top bureaucrats, and without the perks

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They have to beg for the resources and facilities to hold seminars, travel to conferences, etc.

The bureaucratic proliferation under the Ministry of Education, is about the same. There are in Irkutsk 5 institutes, viz.

1. Irkutsk State University
2. Polytechnic Institute
3. Institute of Public Economy
4. Pedagogical Institute
5. Institute of Foreign Languages

and their bureaucratic structure is roughly comparable to that of institutes in the Academy. For instance, in the State University more than half the staff is non-academic.

This data on bureaucratic proliferation is no longer pertinent to the rapidly deteriorating Russian situation (note 15). But it should serve as a warning to ecologists against the dangers of allowing an ecological bureaucracy to germinate.

Postscript 2: Ecological evasion (note 16)

The ecological movement will stumble if it is unable to locate the peccator element behind acts of environmental vandalism, and attributes such acts to illusory, non-existent factors. Consider the statement by Albert Gore, the Vice-President of the United States:

... economics, like any tool, distorts our relationship to the world even as it gives us impressive new powers. Because we come to rely so completely on the capabilities conferred by our economic system, we adapt our thinking to its contours and begin to assume that our economic theory can provide a comprehensive analysis of whatever we wish it to interpret.

Here our acceptance of 'economic theory' is suggested as a cause of our ecological woes. But economics, as Aristotle, the scholastics, Adam Smith and Marx conceived it, is a branch of ethics. As The Rev. Thomas Malthus wrote:

... it must be acknowledged ... that it [economics] approaches more nearly to the science of morals and politics²².

Thus, what Vice President Gore is talking about is a pseudo-scientific economics with distorted ethics. By not pointing this out, he abdicates the responsibility of identifying the real culprits, to wit, capitalist mammonism, excessive hedonism, and the survival-necessitated encroachment of natural resources by the exploited poor.

On p. 257 of his book, Gore attributes our ecological woes to the influence of a 'Cartesian spell'. This again is

most misleading. Our ecological woes all stem, in the last analysis, from the human vices of cupidity and arrogance, and as our quotation of Genesis 6:6 in Section 2 shows, these vices antedate by far the rise of Platonism, Cartesianism, economics and other factors that Gore unjustly denigrates. The latter are almost entirely irrelevant.

To be effective the ecological movement must know its true adversaries.

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Notes:

1. Religionists sometimes bring the divine into their teleology. Thus, Mahatma Gandhi described the Quetta earthquake in the 1930s as an act of God to punish India for the sinful practice of

untouchability The underlying idea is at least as old as the Book of Genesis, where we read

And God saw that the wickedness of man was great and that every imagination of the thought of his heart was only evil continually (Genesis 6.5)

And the Lord said, 'I will destroy man....' (Genesis 6:7)

2. For a fuller description, see ref. 8.
3. Canon lawyers from Bologna, so-called, because they were disciples of the Benedictine (or perhaps Camaldolese) monk, Magister Gratian, who compiled the treatise, the *Decretum*, on canon law, (c. 1140)
4. Unaware of the work of the scholastics, Marx learned his labor theory from Ricardo.
5. See Postscript on Russian bureaucracy at the end of this paper.
6. The Amish are descendents of the non-violent wing of the Annabaptists, the more violent wing of which, led by Thomas Munster, fought the peasant wars in Central Europe during the 1520s.
7. If they continue in agricultural practices that pollute the rivers, it can only be because they have not been alerted to this in a sufficiently religious manner.
8. The moot question confronting ecologists is whether it is scientifically feasible to incorporate such small and soundly functioning units, that abide by the good stewardship principle, into an increasingly automatized global economy. Economists have not addressed this important issue.
9. We need not tarry over the precise demarcation of capitalism *vis-a-vis* other perverted economies, such as serfdom and slavery.
10. The American telephone industry is one of the best examples of entrepreneurship and enlightened capitalism, but as we see it is impotent to stop the mammonish misuse of its services by the pornography marketing sector of capitalism
11. It is essential that teachers mention in the classroom the different meanings attached to the word 'God'. To excite youthful curiosity there should be some discussion of the wide spectrum of approaches to this central concept, ranging from the impersonal God of Spinoza to the personal God with whom one can commune in prayer.
12. Indeed the Declaration of Independence opens with a statement, presumed "self-evident":
That all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.
13. The relevant data, for which the writer is very grateful to Dr L. Volkov, reached him only after the paper was completed.
14. On the other hand, the Irkutsk Regional Hospital for Infectious Diseases with about 200 beds in 60 rooms has exactly one telephone.
15. The deterioration stems largely from the falling resources available for scientific research. There is a 30% curtailment, approximately, in the number of research positions, and a drop in the salaries attached to them in relation to that of qualified factory workers. A good many researchers are obliged to engage in commercial rather than scientific projects. By a strange irony, it is now the very scientific bureaucracy that is striving to slow down this deterioration!
16. Written, after the paper was completed on encountering the book *Earth in a Balance* by Albert Gore, Plume Publishers, NY, 1993

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